

WHAT IS CLAIMED:

1. (Previously Presented) A filter device for purification and/or for at least partial dealkalization of raw water, comprising:

a raw water inlet and a pure water outlet,

a filter line A having one flow channel segment and a first filtration segment, and

a blending line B having an adjustable distribution valve and a second filtration segment, wherein the filter line A and blending line B are connected to raw water inlet by a separation device and wherein the filter line A and blending line B are connected to a pure water outlet by a connection device, wherein both filtration segments are arranged in an inner container, wherein flow characteristics of components of the blending line B, defined by the pressure loss function $\Delta p_B(\dot{V}_B)$, is adapted, to a flow characteristic of components of the filter line A, defined by the pressure loss function $\Delta p_A(\dot{V}_A)$, in such a manner, that for at least one blended portion X with $X = \dot{V}_B / (\dot{V}_A + \dot{V}_B)$, for volume flows of a first volume flow range between $\dot{V}_1 = 10 \text{ l/h}$ to $\dot{V}_2 = 120 \text{ l/h}$, for at least a second volume flow range having a range of at least 5 l/h within the first volume flow range, a blend condition:

$$\frac{\dot{V}_B \frac{1-X}{X} - \dot{V}_A}{\dot{V}_A} \leq 0.15 = G$$

is satisfied, whereby G represents a threshold value of the blended condition, $\Delta p_A(\dot{V}_A)$ the pressure loss in the filter line A and $\Delta p_B(\dot{V}_B)$ a pressure loss in the blending line B, in dependence of the volume flows \dot{V}_A , \dot{V}_B in liters per minute of water in the lines A and B.

2. (Previously Presented) The filter device according to claim 1, wherein the distribution valve (20a) and the second filtration segment (20b) are designed in such a fashion that in the second volume flow range: $\Delta p_{B1}(\dot{V}_B) < \Delta p_{B2}(\dot{V}_B)$ is fulfilled, whereby $\Delta p_{B1}(\dot{V}_B)$ is a pressure loss function of the distribution valve (20a) and $\Delta p_{B2}(\dot{V}_B)$ is a pressure loss function of the second filtration segment (20b).

3. (Previously Presented) The filter device according to claim 1, wherein, in a fully open state, the distribution valve (20a) has a flow characteristic $\Delta p_{B1}(\dot{V}_B)$, which is adapted to a flow characteristic $\Delta p_{A1}(\dot{V}_A)$ of the flow channel segment (10a), and that pressure loss functions $\Delta p_{A2}(\dot{V}_A)$ and $\Delta p_{B2}(\dot{V}_B)$ of the first and the second filtration segments (10b, 20b) are mutually adjusted, whereby the adjustment depends on the desired blending.

4. (Previously Presented) The filter device according to claim 3, wherein a cross flow surface Q_A and Q_B , expressed in m^2 , and distances h_a and h_b , expressed in m, of the first and the second filtration segments (10b, 20b), are adjusted in such a way that, for pressure loss function D_A and D_B , expressed in kPah/m^3 , of the two filtration segments (10b, 20b), the following relationship is satisfied:

$$D_A = \frac{X}{1-X} D_B \text{ whereby}$$
$$D_A = \int_0^{h_A} \frac{S_A(h)}{Q_A(h)} dh$$
$$D_B = \int_0^{h_B} \frac{S_B(h)}{Q_B(h)} dh$$

and $S_A(h)$ and $S_B(h)$, expressed in kPah/m^2 , are pressure loss coefficients of filter materials.

5. (Previously Presented) The filter device according to claim 4, wherein, Q_A lies in the range of 5 cm^2 to 600 cm^2 and Q_B lies in the range of 1 cm^2 to 300 cm^2

6. (Withdrawn) The filter device according to claim 1, further comprising having filter material in filter line A or B or a combination thereof being filter granular material with average grain size in the range of 0.1 to 2 mm.

7. (Previously Presented) The filter device according to claim 1, further comprising having filter material in filter line A or B or a combination thereof being a filter block with an average pore size in the range of 0.1 to 100 μm .

8. (Withdrawn) The filter device according to claim 1, wherein outflow from the outlet of the second filtration segment (20b) flows into the first filtration segment (10b).

9. (Withdrawn) The filter device according to claim 8, wherein the outflow from the outlet of the second filter segment (20b) flows into a second half of the first filtration segment (10b).

10. (Previously Presented) The filter device according to claim 1, wherein the inner container comprises a first filter chamber (54), in which a second filter chamber (55) is arranged, whereby each filter chamber (54, 55) is connected with a partial flow flowing in from above, and below both the filter chambers (54, 55) a common collection chamber (57) with the pure water outlet (5) arranged for collection of filtered partial flows.

11. (Withdrawn) The filter device according to claim 10, wherein at least one of the filter chambers (54, 55) is subdivided into at least two chamber segments (54a, 54b), in which different filter materials are arranged.

12. (Withdrawn) The filter device according to claim 10, wherein filter materials are arranged in the common collection chamber (57) or in the pure water outlet (5), or a combination thereof.

13. (Previously Presented) The filter device according to claim 10, wherein both the filter chambers (54, 55) extend up from the common collection chamber (57), whereby the first filter chamber (54) surrounds the second filter chamber (55) in annular form.

14. (Withdrawn) The filter device according to claim 10, wherein the inner container comprises a bottom wall, wherein on the bottom wall (52) of the inner container (50), an annular drainage plate (71) with filtrate orifices (72) is mounted, which

has radial collection channels (73) on the side facing the bottom wall (52), and a cupular insert chamber (70) extends upwards from the drainage plate (71).

15. (Withdrawn) The filter device according to claim 14, wherein a double-walled pipe (60) is mounted in the inner container (50).

16. (Withdrawn) The filter device according to claim 15, wherein there is an outer pipe (61a) of the double-walled pipe (60) which projects into the first filter chamber (54).

17. (Withdrawn) The filter device according to claim 16, wherein the outer pipe (61a) has a distributor device (63) in the area of the first filter chamber (54) for distribution of inflowing water.

18. (Withdrawn) The filter device according to claim 17, wherein the distributor device (63) has nozzles (62) encircling a perimeter of the outer pipe (61a).

19. (Previously Presented) The filter device according to claim 10, wherein the first filter chamber (54) is filled at least with ion exchanger resin.

20. (Previously Presented) The filter device according to claim 10, wherein the second filter chamber (55) is filled at least with activated carbon.

21. (Previously Presented) The filter device according to claim 2, wherein, in a fully open state, the distribution valve (20a) has a flow characteristic $\Delta p_{B1}(\dot{V}_B)$, which is adapted to a flow characteristic $\Delta p_{A1}(\dot{V}_A)$ of the flow channel segment (10a), and that pressure loss functions $\Delta p_{A2}(\dot{V}_A)$ and $\Delta p_{B2}(\dot{V}_B)$ of the first and the second filtration segments (10b, 20b) are mutually adjusted, whereby the adjustment depends on the desired blending.

22. (Previously Presented) The filter device according to claim 21, wherein a cross flow surface Q_A and Q_B , expressed in m^2 , and distances h_a and h_b , expressed in m, of the first and the second filtration segments (10b, 20b), are adjusted in such a way that, for pressure loss function D_A and D_B , expressed in $kPah/m^3$, of the two filtration segments (10b, 20b), following relationship is satisfied:

$$D_A = \frac{X}{1-X} D_B \text{ whereby}$$

$$D_A = \int_0^{h_A} \frac{S_A(h)}{Q_A(h)} dh$$

$$D_B = \int_0^{h_B} \frac{S_B(h)}{Q_B(h)} dh$$

and $S_A(h)$ and $S_B(h)$, expressed in $kPah/m^2$, are pressure loss coefficients of the filter materials.

23. (Previously Presented) The filter device according to claim 13, wherein the inner container comprises a bottom wall, wherein on the bottom wall (52) of the inner container (50), an annular drainage plate (71) with filtrate orifices (72) is mounted, which has radial collection channels (73) on the side facing the bottom wall (52), and a cupular insert chamber (70), extends upwards from the drainage plate (71).

24. (Withdrawn) The filter device according to claim 18, wherein the first filter chamber (54) is filled at least with ion exchanger resin.

25. (Withdrawn) The filter device according to claim 18, wherein the second filter chamber (55) is filled at least with activated carbon.